

DEVELOPMENT AND TESTING OF A MULTI-DIMENSIONAL MODEL FOR MEASURING GENERAL ORGANIZATIONAL PERFORMANCE

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Abstract:

Organizational performance can be evaluated from multiple perspectives, being a multifaceted phenomenon with multiple dimensions. Such a state create difficulties in the research of organizational performance because building of a theory on performance measurement involves the development and testing of a model to explain or predict a particular phenomenon based on a generalized model. Therefore, it is necessary a generally accepted unified view on organizational performance and to capture all of its dimensions. The combination of dimensions and organizational performance indicators illustrating these dimensions is a model of organizational performance measurement. In this work, it will be proposed and tested a model of organizational performance measurement on a pilot sample of companies listed on the Bucharest Stock Exchange and will be validated based on empirical collected data.

Keywords: organizational performance, measuring performance, multi-dimensional model, BSE

1. Introduction

The performance context is a concept that cannot be studied independently, only associated with a structure, service, or person representing an attribute that express their success (Hofer, 1975). Most research in management focuses on the determinants of performance. Researchers (Venkatraman and Ramanujam, 1986; Cameron, 1986; Brush and Vanderwerf, 1992; Murphy et al, 1996; Barney, 2002; Carton and Hofer, 2006; Wagner, 2008; Cameron, 2010; Merchant and Van der sted, 2011; Hubbard, 2014; Venkatraman and Ramanujam, 2017; Hatry, 2017) consider that the independent variables are proposed as determinants of change occurring in the values of the dependent variables. Organizational performance measurement allow organizations to create improved reports and creates a sustainable competitive advantage (Bartuseviciene and Sakalyte, 2013).

In general, the concept of organizational performance is based on the idea that an organization is voluntary association of resources: financial, production, physical and human resources in order to achieve a common goal (Brush and Vanderwerf, 1992; Murphy et al., 1996). Those who provide financial and physical resources to

the organization will stay, just as long as they are satisfied with the value they receive in return. Based to these considerations, we consider that the essence of the performance is the creation of value. As long as the value created by using financial and physical resources brought by the owners of the organization is equal to or greater than the amount expected by owners organization, resources will continue to be available to the organization and the organization will continue to exist. Therefore, value creation is one of the essential general performance criteria for any organization. To have a multi-dimensional performance is necessary to take into account other categories of stakeholders of the organization (employees, the state, local communities, suppliers. Customers, etc.) not just shareholders (Sitnikov and Bocean, 2013). This involves the assessment of distribution arrangements and relationships concerning created value, and consider this assessment in measurement of organizational performance. Such an approach basically involves the construction of a model for measuring the organizational performance from multi-stakeholder view (Venkatraman and Ramanujam, 2017).

The multitude of indicators, methods, models of organizational performance measurement creates difficulties in selecting methods that can achieve an adequate process of organizational performance measurement aligned with the goals and consistent with the philosophy and culture of the organization (Richard, 2009).

Starting from the idea that there are several dimensions of the concept of performance, the positive performance in a dimension may result at the same time in negative results in another dimension of organizational performance (Hubbard, 2014). Examining each dimension separately, without considering the other dimension will undeniably lead to different conclusions, compared to examination of the synergistic effects of the two dimensions simultaneously. To equate and weight these levels of performance is required an indicator (unit) which is able to be used in each dimension. Therefore we believe that are required aggregate or composite indicators that by weighting illustrate performance in an area.

Synthetizing, the combination of dimensions and organizational performance indicators illustrating these dimensions is a model of organizational performance measurement. In this paper, it will be proposed and tested a model of organizational performance measurement on a pilot sample of companies listed on the Bucharest Stock Exchange and will be validate based on empirical data. Structure of paper consists of five sections. The first section provides introductory elements on organizational performance dimensions. The second section sets research methodology. In the following five sections are described the steps of developing and testing multi-dimensional model of organizational performance. Section five concludes and presents future research directions.

2. Research methodology

The most effective measures of performance are those that capture different dimensions or characteristics of organizational performance. It is therefore necessary to build a multi-dimensional model to capture fully the concept of organizational performance. Marr (2006) distinguishes the following activities in the process of building a multi-dimensional model of performance measurement: building a model of performance measurement, necessary data collection, data analysis and interpretation, communication of results. Such a process of performance measurement is a structured, result-oriented process.

Our approach to achieve a multidimensional model involves the five steps:

a. Construction of a sample of companies. For this we chose listed companies included in the BET-XT index of the Bucharest Stock Exchange. We chose these companies because they are among the most traded companies on the Bucharest Stock Exchange.

b. Secondly, we selected organizational performance indicators that can be calculated based on the available data in the same format for all companies on the website of the Bucharest Stock Exchange (BVB 2017) in order to ensure comparability of results. Period under investigation will be 2013-2015.

c. Third, we tested indicators for the sample companies to select the most relevant indicators to be included in the multi-dimensional model. Testing was performed by calculating the correlations between the variables and selecting those which are in significant correlation having the largest coefficient of determination (R-squared).

d. Fourth, multi-dimensional model is built based on selected indicators. To parameters that will be used will be assigned values that contribute to the homogenization of individual indicators and to achieve an overall indicator of organizational performance

e. Finally we test the model for all companies from sample and we will make comparisons with key individual indicators used to measure financial performance.

3. Structure of the research sample

In view of the composition of the sample for empirical research we chose initially the 25 listed companies included in the BET-XT index of the Bucharest Stock Exchange. BET-XT index reflects the price trends for 25 companies traded on the regulated market, including financial investment societies (SIFs). Since 2015, for selection it applies criteria related with transparency and quality reporting of issuers and their communication with investors (BVB, 2017). In constitution of the index are included companies from different sectors: financial, banking, energy, industry, construction. Table 1 presents the list of companies included in the BET-XT index of the Bucharest Stock Exchange.

Table 1

Companies included in the BET-XT on 03/17/2017

Symbol	Company	Number of shares	Price	Weight in the index (%)
SNP	OMV PETROM S.A.	56 644 108 335	0,3055	15,81
TLV	BANCA TRANSILVANIA S.A.	3 646 047 792	2,7400	15,03
FP	FONDUL PROPRIETATEA	10 786 251 902	0,8800	14,43
BRD	BRD - GROUPE SOCIETE GENERALE S.A.	696 901 518	12,2000	10,36
SNG	S.N.G.N. ROMGAZ S.A.	385 422 400	28,7000	10,11
EL	SOCIETATEA ENERGETICA ELECTRICA S.A.	345 939 929	14,0000	7,38
TGN	S.N.T.G.N. TRANSGAZ S.A.	11 773. 844	357,0000	6,40
TEL	C.N.T.E.E. TRANSELECTRICA	73 303 142	32,0000	3,57

SIF1	SIF BANAT CRISANA S.A.	548 849 268	1,9500	3,26
SIF5	SIF OLTENIA S.A.	580 165 714	1,7700	3,13
SIF2	SIF MOLDOVA S.A.	1 038 179 176	0,8420	2,66
SIF4	SIF MUNTENIA S.A.	807 036 515	0,7220	1,77
SIF3	SIF TRANSILVANIA S.A.	2 184 286 664	0,2535	1,69
COTE	CONPET SA	8 657 528	97,4000	1,28
SNN	S.N. NUCLEARELECTRICA S.A.	301 513 851	6,2300	1,14
BVB	BURSA DE VALORI BUCURESTI SA	7 674 198	31,0000	0,72
TRP	TERAPLAST SA	566 432 660	0,5240	0,36
IMP	IMPACT DEVELOPER & CONTRACTOR S.A.	277 866 574	0,6860	0,17
VNC	VRANCART SA	863 717 920	0,2060	0,16
BCC	BANCA COMERCIALA CARPATICA S.A.	2 202 742 822	0,1080	0,14
IARV	IAR SA Braşov	18.878 853	7,4000	0,13
ELGS	ELECTROARGES SA	69 764 650	1,4700	0,12
TBM	TURBOMECHANICA S.A.	369 442 475	0,1535	0,09
ROCE	ROMCARBON SA	264 122 096	0,1300	0,05
MCAB	ROMCAB SA	9 386 066	1,8800	0,02

Source: BVB, 2017

4. Selection of organizational performance indicators

Research financial information made public in uniform format on the website of the Bucharest Stock Exchange (financial indicators were extracted from individual accounts reported to the Finance Ministry). After analyzing the financial information, we excluded from the sample companies in the financial and banking sector, due to the specificity of areas. We also excluded energy company Electrica S.A., IMPACT DEVELOPER & CONTRACTOR S.A. and ROMCAB SA because they have incomplete data on financial indicators for investigated years (2013-2015). Following the selection made remaining 12 companies:

- OMV Petrom (SNP) is the largest integrated oil and gas producer in Southeastern Europe.
- Romgaz (SNG) is the largest producer and main supplier of natural gas in Romania.
- Transgaz (TGN) aims to fulfill the national strategy established for transport, international transit, dispatching and research-design in transport of natural gas area.
- Transelectrica (TEL) provide transport services and system power in the national energy system.

- Nuclearelectrica (SNN) deals with the production of electricity, thermal and nuclear fuel.
- CONPET S.A. (COTE) provides specialized transport oil pipeline and tank cars on track, ensuring supply to refineries with crude oil and its derivatives domestically produced and imported.
- Teraplast (TRP) is currently the largest PVC processor in Romania and one of the most important Romanian producer of construction materials, equipment and facilities.
- VRANCART S.A. Adjud (VNC) is one of the leading manufacturers of corrugated cardboard, corrugated paper and sanitary papers in Romania, with an experience of over 38 years in this field.
- IAR Brasov (IASV) is one of Romania's aviation enterprises currently held by Airbus Helicopters. The company's main activity is maintenance, repair and modernization of helicopters.
- ELECTROARGES SA (ELGS) produce domestic appliances, household appliances, professional equipment for hotels and industrial facilities, portable power tools, devices, tools and kits.
- Turbomecanica (TBM) is a manufacturer of aircraft components in Romania, being the sole producer of gas turbine engines and mechanical assemblies in Romanian aircraft industry.
- Romcarbon (ROCE) is a company known on the Romanian and the European market as a plastics processor.

Based on the financial information collected for the 12 companies included in the sample we selected organizational performance indicators that can be calculated based on these information. To estimate organizational performance we used indicators from the following categories: rentability indicators, indicators of growth, liquidity ratios, indicators of leverage, efficiency indicators, operational indicators, market value indicators, aggregate indicators.

In our research, which aims to develop and test a model multi-dimensional of organizational performance measurement, we start from a **primary hypothesis (PH)** that indicators of rentability and the value market indicators are those that correlate most and illustrating best performance of the organization. To synthetize better this performance, in case of primary hypothesis validation, we used two aggregate indicators of organizational performance, calculated as the average of individual indicators: return aggregate index and aggregate index of market value.

Besides the main hypothesis we formulated a series of secondary hypotheses on the way of the organizational performance indicators correlation:

Secondary hypothesis 1 (SH1). Indicators of leverage, being a picture of the level of funding with outside sources, will be inversely correlated with indicators of rentability and the market value indicators.

Secondary hypothesis 2 (SH2). Indicators of leverage, being the ratio between liabilities and assets or equity, will be inversely correlated with indicators of liquidity that are calculated as ratio between assets and liabilities.

Secondary hypothesis 3 (SH3). Operational indicators, being indicators which illustrate labor productivity (turnover created by an employee and net profit created by an employee) will be correlated with indicators of profitability and the market value.

The factors and their calculation formulas are shown in Table 2.

Table 2

Organizational performance indicators selected in research

Category	Indicator	The calculation formula
Rentability indicators	The evolution of gross result (GR) (Income-expenses)	$[(GR \text{ of the current} / GR \text{ of the base period}) - 1] \times 100$
	The evolution of net result (NR)	$[(NR \text{ of the current} / NR \text{ of the base period}) - 1] \times 100$
	Return on assets (ROA)	$Net \text{ profit} \times 100 / Total \text{ assets}$
	Return on equity (ROE)	$Net \text{ profit} \times 100 / Equity$
	Return on sales - (ROS)	$Net \text{ profit} \times 100 / Turnover$
	Return on investment (ROI)	$Net \text{ profit} \times 100 / (\text{debt} + \text{equity})$
Growth indicators	Evolution of turnover (T)	$[(T \text{ of the current} / T \text{ of the base period}) - 1] \times 100$
	Evolution of the number of employees (NE)	$[(NE \text{ of the current} / NE \text{ of the base period}) - 1] \times 100$
	Evolution of the assets	$[(Assets \text{ of the current} / Assets \text{ of the base period}) - 1] \times 100$
Liquidity indicators	Current liquidity ratio (RLC)	$Current \text{ assets} / Current \text{ liabilities}$
	Quick liquidity ratio (RLR)	$(Current \text{ Assets} - Inventories) / Current \text{ liabilities}$
	Immediate liquidity ratio (RLI)	$Cash / Current \text{ liabilities}$
Leverage indicators	Debt-to-equity (LDC)	$Debt \times 100 / equity$
	Debt-to-assets (LDA)	$Debt \times 100 / Total \text{ assets}$
Efficiency indicators	Total asset turnover	$Turnover / Total \text{ assets}$
	Working capital turnover	$Turnover / (Current \text{ Assets} - Current \text{ Liabilities})$
	Receivables turnover	$Turnover / Receivables$
Operational indicators	Labor productivity (PM)	$Turnover / Number \text{ of employees}$
	Net profit created by an employee (PA)	$Net \text{ Profit} / Number \text{ of employees}$
Market value indicators	Adjusted Tobin Q (TQ)	$Capitalization / Total \text{ assets}$
	Price earnings ratio (PER)	$Capitalization / Net \text{ profit}$
	Price to sales (P/S)	$Capitalization / Sales$
	Price to book value (P/BV)	$Capitalization / Equity$
Aggregate indicators	Return aggregate index	$(ROA+ROE+ROS+ROI)/4$
	Aggregate index of market value	$(TQ+ P/S+P/BV)/3$

Source: Adapted from Carton and Hofer, 2006

5. Testing correlations between organizational performance

At this stage we calculated organizational performance indicators. In the tables 3, 4 and 5 are presented the values of these indicators for the 12 companies selected in the sample, for period 2013-2015.

Table 3

Organizational performance indicators for the sample selected in 2015

	SNP	SNG	TGN	TEL	SNN	COTE	TRP	VNC	IARV	ELGS	TBM	ROCE
The evolution of gross result (GR)	-127.4%	-17.87%	-0.57%	-0.46%	15.55%	16.78%	185.20%	-0.70%	114.29%	-1.03%	-143.52%	-82.31%
The evolution of net result (NR)	-134.3%	-15.29%	-2.74%	0.68%	12.08%	22.87%	201.47%	-4.07%	109.37%	0.34%	-208.24%	-82.35%
Return on assets (ROA)	-1.47%	10.28%	9.43%	5.77%	1.47%	6.51%	9.78%	6.59%	3.79%	5.79%	2.53%	2.02%
Return on equity (ROE)	-2.51%	12.32%	13.69%	12.09%	1.99%	8.27%	18.77%	12.73%	11.30%	11.45%	10.63%	4.91%
Return on sales - (ROS)	-4.61%	29.47%	30.90%	12.24%	8.52%	16.57%	10.59%	8.66%	9.14%	4.60%	5.56%	3.57%
Return on investment (ROI)	-2.41%	12.32%	13.69%	10.06%	1.66%	8.27%	15.29%	9.37%	11.30%	10.86%	4.95%	3.02%
Evolution of turnover (T)	-17.1%	-9.81%	-2.26%	6.35%	-2.57%	1.69%	15.27%	6.39%	28.72%	8.16%	28.81%	11.71%
Evolution of the number of employees (NE)	-12.7%	-0.67%	-1.75%	0.00%	-0.83%	-0.29%	-15.64%	-0.11%	-0.32%	3.97%	27.04%	5.79%
Evolution of the assets	-5.00%	-4.35%	6.09%	2.63%	-1.81%	-14.73%	19.86%	11.22%	37.33%	3.03%	-10.54%	17.65%
Current liquidity ratio	1.600	6.796	6.561	1.857	4.763	9.409	1.488	1.350	4.640	2.309	0.802	0.812
Quick liquidity ratio	1.126	5.947	6.266	1.822	3.931	9.166	1.039	0.957	3.380	1.337	0.203	0.567
Immediate liquidity ratio	0.194	0.131	0.670	1.007	0.661	2.693	0.144	0.208	2.758	0.204	0.123	0.154
Debt-to-equity	18.25%	10.59%	9.15%	54.97%	24.60%	6.13%	59.58%	51.04%	33.19%	43.92%	193.55%	98.53%
Debt-to-assets	10.29%	8.51%	5.46%	23.65%	18.47%	4.68%	27.75%	24.60%	11.81%	23.88%	57.46%	38.88%
Total asset turnover	0.31	0.34	0.26	0.43	0.18	0.38	0.83	0.71	0.44	1.35	0.57	0.54
Working capital turnover	6.15	1.04	1.14	7.95	1.19	0.98	7.05	11.61	1.24	5.06	-5.84	-4.51
Receivables turnover	4.28	4.02	1.81	4.10	10.40	9.04	3.87	4.83	7.23	10.58	15.09	5.21
Labor productivity	878481	654609	331615	1349651	860330	223799	699673	232915	416854	337116	171141	228035
Net profit created by an employee	-40475	192907	102480	165163	73325	37089	74104	20170	38094	15524	9523	8132
Adjusted Tobin Q (TQ)	0.47	1.62	0.99	0.62	0.25	1.66	2.15	0.64	1.94	0.81	0.20	0.16
Price earnings ratio (PER)	-26.05	8.78	6.67	5.93	13.04	10.55	9.82	5.70	10.45	4.51	3.26	5.45
Price to sales (P/S)	1.20	2.59	2.06	0.73	1.11	1.75	1.04	0.49	0.95	0.21	0.18	0.19
Price to book value (P/BV)	0.65	1.08	0.91	0.72	0.26	0.87	1.84	0.73	1.18	0.52	0.35	0.27
Return aggregate index	-2.75%	16.10%	16.93%	10.04%	3.41%	9.90%	13.61%	9.34%	8.88%	8.17%	5.92%	3.38%
Aggregate index of market value	0.77	1.76	1.32	0.69	0.54	1.43	1.68	0.62	1.36	0.51	0.24	0.21

Table 4

Organizational performance indicators for the sample selected in 2014

	SNP	SNG	TGN	TEL	SNN	COTE	TRP	VNC	IARV	ELGS	TBM	ROCE
The evolution of gross result (GR) (Income-expenses)	-55.13%	37.50%	42.02%	80.11%	-70.19%	56.10%	143.25%	-324.9%	274.97%	-30.18%	-11.71%	9946%
The evolution of net result (NR)	-62.04%	41.62%	50.23%	77.98%	-68.57%	64.34%	81.01%	-377.9%	242.21%	-36.07%	-58.63%	69360%
Return on assets (ROA)	4.10%	12.16%	10.50%	6.27%	1.29%	4.48%	3.75%	7.85%	2.34%	6.31%	-2.04%	13.50%
Return on equity (ROE)	6.98%	14.52%	15.10%	12.81%	1.78%	7.11%	7.63%	14.89%	7.73%	11.92%	-11.07%	28.80%
Return on sales - (ROS)	11.13%	31.38%	31.06%	12.93%	7.41%	13.71%	4.05%	9.60%	5.62%	4.96%	-6.62%	22.57%
Return on investment (ROI)	6.66%	14.52%	15.00%	10.07%	1.45%	7.11%	5.86%	10.98%	7.73%	10.79%	-4.57%	19.75%
Evolution of turnover (T)	-8.63%	15.38%	8.98%	14.24%	-7.08%	7.50%	2.58%	7.33%	187.25%	-3.48%	55.27%	12.66%
Evolution of the number of employees (NE)	-6.05%	-1.02%	-1.72%	0.00%	-2.57%	-3.66%	-2.16%	-12.58%	0.64%	-0.83%	3.92%	7.68%
Evolution of the assets	12.92%	7.40%	29.94%	7.40%	-16.42%	15.40%	3.77%	2.44%	36.21%	-1.93%	-4.71%	-1.43%
Current liquidity ratio	1.311	6.749	5.029	1.652	4.058	7.136	1.206	1.371	4.865	2.358	0.894	0.767
Quick liquidity ratio	0.955	6.183	4.905	1.622	3.184	6.993	0.757	0.969	2.812	1.651	0.241	0.527
Immediate liquidity ratio	0.007	0.110	0.083	0.191	0.091	6.207	0.046	0.049	1.685	0.118	0.190	0.127
Debt-to-equity	24.04%	11.57%	11.22%	71.21%	28.72%	7.73%	70.13%	55.22%	40.24%	45.96%	252.73%	82.69%
Debt-to-assets	13.50%	8.91%	6.62%	29.49%	21.15%	4.76%	31.96%	26.37%	13.73%	24.65%	59.54%	37.10%
Total asset turnover	0.35	0.36	0.29	0.41	0.18	0.32	0.86	0.74	0.47	1.29	0.39	0.57
Working capital turnover	9.73	1.12	1.36	3.54	1.28	1.13	14.89	10.84	1.12	3.99	-4.66	-9.27
Receivables turnover	4.32	3.18	1.82	2.57	6.78	10.77	4.37	4.44	4.97	8.27	17.00	5.32
Labor productivity	924194	720895	333352	1269047	875728	219446	512047	218689	322805	324034	168790	215953
Net profit created by an employee	102829	226196	103526	164044	64878	30096	20737	21002	18137	16085	-11178	48739
Adjusted Tobin Q (TQ)	0.63	2.11	0.96	0.62	0.27	1.14	0.53	0.50	0.78	1.41	0.16	0.16
Price earnings ratio (PER)	12.58	9.67	6.16	6.00	16.39	9.27	6.99	4.05	5.78	5.65	-3.01	0.79
Price to sales (P/S)	1.40	3.03	1.91	0.78	1.21	1.27	0.28	0.39	0.32	0.28	0.20	0.18
Price to book value (P/BV)	0.88	1.40	0.93	0.77	0.29	0.66	0.53	0.60	0.45	0.67	0.33	0.23
Return aggregate index	7.22%	18.14%	17.91%	10.52%	2.98%	8.10%	5.32%	10.83%	5.85%	8.50%	-6.07%	21.15%
Aggregate index of market value	0.97	2.18	1.27	0.72	0.59	1.02	0.45	0.50	0.52	0.79	0.23	0.19

For 2013 growth indicators, illustrating trends in financial indicators, are not calculated because on the BSE website can be found only financial data for 2013-2015. Data for 2012 are not available.

Table 5

Organizational performance indicators for the sample selected in 2013

	SNP	SNG	TGN	TEL	SNN	COTE	TRP	VNC	IARV	ELGS	TBM	ROCE
The evolution of gross result (GR) (Income-expenses)	-	-	-	-	-	-	-	-	-	-	-	-
The evolution of net result (NR)	-	-	-	-	-	-	-	-	-	-	-	-
Return on assets (ROA)	12.01%	9.07%	8.41%	3.68%	3.43%	3.18%	2.10%	-2.82%	1.05%	10.01%	-4.05%	0.02%
Return on equity (ROE)	18.50%	10.71%	10.89%	7.73%	4.67%	4.81%	4.56%	-6.29%	2.40%	21.16%	-26.21%	0.06%
Return on sales - (ROS)	26.78%	25.56%	22.53%	8.30%	21.90%	8.97%	2.30%	-3.71%	4.72%	7.49%	-24.86%	0.04%
Return on investment (ROI)	17.53%	10.71%	10.72%	5.72%	3.86%	4.81%	3.35%	-3.94%	2.40%	17.89%	-8.93%	0.03%
Evolution of turnover (T)	-	-	-	-	-	-	-	-	-	-	-	-
Evolution of the number of employees (NE)	-	-	-	-	-	-	-	-	-	-	-	-
Evolution of the assets	-	-	-	-	-	-	-	-	-	-	-	-
Current liquidity ratio	1.346	5.931	2.348	1.522	4.026	6.317	1.070	0.873	17.236	1.427	1.115	0.544
Quick liquidity ratio	0.966	5.280	2.233	1.484	3.264	6.164	0.644	0.580	10.485	0.785	0.046	0.394
Immediate liquidity ratio	0.001	0.057	0.040	0.284	0.493	5.155	0.038	0.021	0.529	0.057	0.005	0.089
Debt-to-equity	20.81%	12.22%	13.23%	74.26%	26.34%	8.07%	81.99%	82.75%	16.38%	65.13%	309.37%	154.85%
Debt-to-assets	13.12%	9.67%	9.37%	30.74%	19.67%	5.16%	35.81%	34.50%	7.17%	30.18%	70.88%	49.30%
Total asset turnover	0.44	0.33	0.34	0.39	0.16	0.34	0.87	0.71	0.22	1.31	0.24	0.50
Working capital turnover	12.78	1.11	3.69	4.75	1.25	1.35	39.09	-22.36	0.46	12.29	6.49	-3.00
Receivables turnover	6.67	3.16	3.75	2.85	9.12	8.35	4.86	4.81	1.13	7.22	12.54	4.46
Labor productivity	950353	618432	300610	1110844	918326	196648	488389	178116	113094	332948	112969	206405
Net profit created by an employee	254487	158100	67725	92169	201136	17642	11209	-6605	5334	24953	-28079	76
Adjusted Tobin Q (TQ)	0.79	2.11	0.67	0.32	0.29	0.93	0.37	0.37	0.50	0.83	0.15	0.09
Price earnings ratio (PER)	5.50	13.24	6.52	5.76	6.70	12.45	9.09	-8.75	13.11	3.81	-1.14	318.15
Price to sales (P/S)	1.47	3.38	1.47	0.48	1.47	1.12	0.21	0.32	0.62	0.29	0.28	0.12
Price to book value (P/BV)	1.02	1.42	0.71	0.45	0.31	0.60	0.41	0.55	0.31	0.81	0.30	0.18
Return aggregate index	18.70%	14.01%	13.14%	6.36%	8.47%	5.44%	3.08%	-4.19%	2.64%	14.14%	-16.01%	0.04%
Aggregate index of market value	1.09	2.30	0.95	0.41	0.69	0.88	0.33	0.42	0.48	0.64	0.24	0.13

Based on data of organizational performance indicators we calculated correlations between these indicators to determine the indicators showing the

strongest correlation. Correlations among all organizational performance indicators selected in the study are presented in Appendix 1. In table 6 are presented correlations between indicators targeted by research hypothesis.

Table 6.

The main correlation between organizational performance indicators

	ROA	ROE	ROS	ROI	RLC	RLR	RLI	LDC	LDA	PM	PA	TQ	PS	PBV	IAR	IAP
ROA	1	.894**	.825**	.961**	.073	.183	-.089	-.496**	-.438**	.145	.589**	.537**	.464**	.604**	.958**	.573**
ROE	.894**	1	.740**	.948**	.006	.080	-.027	-.570**	-.431**	.176	.443**	.399*	.216	.450**	.938**	.361*
ROS	.825**	.740**	1	.775**	.322	.465**	.048	-.687**	-.673**	.252	.758**	.493**	.723**	.513**	.911**	.668**
ROI	.961**	.948**	.775**	1	.056	.142	-.014	-.544**	-.470**	.153	.525**	.530**	.342*	.579**	.960**	.503**
RLC	.073	.006	.322	.056	1	.955**	.395*	-.472**	-.617**	-.159	.129	.376*	.459**	.139	.162	.405*
RLR	.183	.080	.465**	.142	.955**	1	.503**	-.559**	-.708**	-.104	.231	.478**	.606**	.242	.273	.541**
RLI	-.089	-.027	.048	-.014	.395*	.503**	1	-.272	-.395*	-.203	-.140	.254	.091	.036	-.007	.148
LDC	-.496**	-.570**	-.687**	-.544**	-.472**	-.559**	-.272	1	.949**	-.303	-.422*	-.480**	-.551**	-.422*	-.638**	-.555**
LDA	-.438**	-.431**	-.673**	-.470**	-.617**	-.708**	-.395*	.949**	1	-.220	-.408*	-.550**	-.660**	-.468**	-.566**	-.647**
PM	.145	.176	.252	.153	-.159	-.104	-.203	-.303	-.220	1	.663**	.059	.292	.244	.208	.225
PA	.589**	.443**	.758**	.525**	.129	.231	-.140	-.422*	-.408*	.663**	1	.376*	.678**	.492**	.637**	.596**
TQ	.537**	.399*	.493**	.530**	.376*	.478**	.254	-.480**	-.550**	.059	.376*	1	.659**	.892**	.524**	.910**
PS	.464**	.216	.723**	.342*	.459**	.606**	.091	-.551**	-.660**	.292	.678**	.659**	1	.652**	.493**	.901**
PBV	.604**	.450**	.513**	.579**	.139	.242	.036	-.422*	-.468**	.244	.492**	.892**	.652**	1	.566**	.892**
IAR	.958**	.938**	.911**	.960**	.162	.273	-.007	-.638**	-.566**	.208	.637**	.524**	.493**	.566**	1	.575**
IAP	.573**	.361*	.668**	.503**	.405*	.541**	.148	-.555**	-.647**	.225	.596**	.910**	.901**	.892**	.575**	1

Studying the correlation among organizational performance indicators it can be seen that the primary hypothesis (HP) is validate. Among the indicators of rentability and the value market indicators (except PER) there are strong correlations which leads us to consider these indicators in the construction of aggregate indicators. The two aggregate indicators of organizational performance, which we calculated as the average of individual indicators (Return aggregate index and aggregate index of market value) are strongly correlated directly with both categories of indicators and two of indicators liquidity (current liquidity ratio and quick liquidity ratio) as the profit per employee.

Regarding indicators of leverage we observed that are inversely correlated with rentability indicators and the market value indicators, which makes the secondary hypothesis 1 (SH1) to be validated. Also, the secondary hypothesis 2 (IPS2) is valid because after research we found that indicators of leverage are inversely correlated with indicators of liquidity. Weaker correlation can be seen between indicators of leverage and immediate liquidity ratio (the latter being calculated based only on liquid assets).

Following the research of secondary hypothesis 3 (SH3), operational indicator net profit created by an employee, is strongly correlated with rentability indicators and the market value indicators (since it is based on profit), while labor productivity it is not correlated with rentability indicators and the market value indicators. This mismatch is due to the fact that labor productivity is calculated on the basis of turnover (indicator comprises only effects without taking into account efforts).

6. Construction of multi-dimensional model for measuring organizational performance

Based on the results of the research hypotheses we consider that a multi-dimensional model must be developed based on the rentability indicators and the market value indicators. Given the close correlation of aggregated indicators of rentability and the market value of individual indicators of overall performance we aggregate these indicators in an indicator of organization's general performance. These indicators can be found in Table 7.

Table 7

The organization's general performance index

		Return aggregate index	Aggregate index of market value	General performance index
2015	SNP	-2.75%	0.77	-2.12%
	SNG	16.10%	1.76	28.34%
	TGN	16.93%	1.32	22.35%
	TEL	10.04%	0.69	6.93%
	SNN	3.41%	0.54	1.84%
	COTE	9.90%	1.43	14.16%
	TRP	13.61%	1.68	22.86%
	VNC	9.34%	0.62	5.79%
	IARV	8.88%	1.36	12.08%
	ELGS	8.17%	0.51	4.17%
	TBM	5.92%	0.24	1.42%
	ROCE	3.38%	0.21	0.71%
2014	SNP	7.22%	0.97	7.00%
	SNG	18.14%	2.18	39.55%
	TGN	17.91%	1.27	22.75%
	TEL	10.52%	0.72	7.57%
	SNN	2.98%	0.59	1.76%
	COTE	8.10%	1.02	8.26%
	TRP	5.32%	0.45	2.39%

	VNC	10.83%	0.5	5.42%
	IARV	5.85%	0.52	3.04%
	ELGS	8.50%	0.79	6.72%
	TBM	-6.07%	0.23	-1.40%
	ROCE	21.15%	0.19	4.02%
2013	SNP	18.70%	1.09	20.38%
	SNG	14.01%	2.3	32.22%
	TGN	13.14%	0.95	12.48%
	TEL	6.36%	0.41	2.61%
	SNN	8.47%	0.69	5.84%
	COTE	5.44%	0.88	4.79%
	TRP	3.08%	0.33	1.02%
	VNC	-4.19%	0.42	-1.76%
	IARV	2.64%	0.48	1.27%
	ELGS	14.14%	0.64	9.05%
	TBM	-16.01%	0.24	-3.84%
	ROCE	0.04%	0.13	0.01%

7. Testing the multi-dimensional model for the organizational performance measuring

To test the model multi-dimensional measuring organizational performance that involves the calculation of a general index of performance based on the indicators of returns and the value market indicators was performed by calculating the correlation with the main individual indicators used for measuring the performance and comparing the correlations obtained by the correlations determine in the case of aggregated indicators of rentability and aggregate index of market value (table 8). It can be seen that the general performance index weighted intensity of correlations with individual indicators, correlations are getting more relevant. Making an average of the correlation coefficients obtained it can be seen that the overall performance index records the highest value of this mean.

During further research we use this index to determine the general performance impact of motivation on performance. Limitations come from that model cannot be applied than listed companies whose market value can be determined based on quotations.

Table 8

Comparing the general performance index correlations with return aggregate index and aggregate index of market value correlations

		Return aggregate index	Aggregate index of market value	General performance index
ROA	Pearson Correlation	.958**	.573**	.752**
	Sig. (2-tailed)	.000	.000	.000
	N	36	36	36
ROE	Pearson Correlation	.938**	.361*	.520**
	Sig. (2-tailed)	.000	.031	.001
	N	36	36	36
ROS	Pearson Correlation	.911**	.668**	.799**
	Sig. (2-tailed)	.000	.000	.000
	N	36	36	36
ROI	Pearson Correlation	.960**	.503**	.666**
	Sig. (2-tailed)	.000	.002	.000
	N	36	36	36
LDC	Pearson Correlation	-.638**	-.555**	-.480**
	Sig. (2-tailed)	.000	.000	.003
	N	36	36	36
LDA	Pearson Correlation	-.566**	-.647**	-.539**
	Sig. (2-tailed)	.000	.000	.001
	N	36	36	36
PA	Pearson Correlation	.637**	.596**	.710**
	Sig. (2-tailed)	.000	.000	.000
	N	36	36	36
TQ	Pearson Correlation	.524**	.910**	.815**
	Sig. (2-tailed)	.001	.000	.000
	N	36	36	36
PBV	Pearson Correlation	.566**	.892**	.840**
	Sig. (2-tailed)	.000	.000	.000
	N	36	36	36
IAR	Pearson Correlation	1	.575**	.736**
	Sig. (2-tailed)		.000	.000
	N	36	36	36
IAVP	Pearson Correlation	.575**	1	.928**
	Sig. (2-tailed)	.000		.000
	N	36	36	36
IPG	Pearson Correlation	.736**	.928**	1
	Sig. (2-tailed)	.000	.000	
	N	36	36	36
Average index of correlation		0.550	0.484	0.562

8. Conclusions

Performance being multi-dimensional, this research seeks to identify the primary dimensions of performance, and demonstrate that they are distinct from each other. For this we want to focus on identifying suitable performance indicators for each primary dimension that was previously established. The combination of dimensions and organizational performance indicators illustrating these dimensions constitute a model of organizational performance measurement.

The best indicators are those that capture different dimensions or characteristics of organizational performance. Starting from this premise, we built a multi-dimensional model to capture fully the concept of organizational performance. We tested this model in 12 listed companies included in the BET-XT index of the Bucharest Stock Exchange. The model assumes also calculated an index of general performance based on aggregated indices of rentability and aggregate index of market value. This model will be used in future research we plan to investigate the relationship between organizational actions and organizational results.

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